



Bi-National Sustainability Laboratory Potential Project Areas

The Bi-national Sustainability Laboratory stimulated two bi-national workshops held in September and October 2002—one on secure commerce, and the other on water. Sandia National Laboratories and CONACyT sponsored the workshops. Attendees at the workshops included technical personnel from US and Mexican research institutions and government agencies, regulatory and enforcement groups, and the private sector.

Both workshops yielded specific areas for further exploration. While the project areas themselves may not be new, the bi-national relationships formed between technical personnel at the workshops *are* new and will significantly enhance the likelihood of successful development of these projects. The teams at the workshops* committed to engaging others in the project areas, and to seek funding.

Secure Commerce

- *Develop smart containers/packaging...* develop tamper-proof product and containers, ranging from the individual item through the transportainer itself to ensure that a) the container has not been tampered with after packing, b) the container has not deviated from an expected transportation route after packing, and c) the product cannot be put into an active mode until close to its final point of use
Benefits: reduced inspections because of increased confidence in package integrity, reduced theft
- *Model the supply chain and activities at the border....* gain a better understanding of processes, flows, activities, and leverage points through modeling of the enterprise, its behavioral (social) rules and constraints, and of the movement of goods and information through it.
Benefits: identify areas where technology can provide significant leverage
- *Enhance information system integrity and management...* use encryption and authentication techniques to enhance security of information; enhance the management of information through better integration of different types of information into a single system; and seek to engage all users with a single system
Benefits: reduce the number of inspections necessary, reduce the amount of paperwork necessary, enhance the security and reliability of the information
- *Enhance in-transit security...* develop an 'artificial dog's nose' to detect new types of contraband on rail cars (chemical, biological); develop image interpretation software for radiographic images to help eliminate human error.
Benefits: higher probability of interdiction of chemical or biological contraband/weapons

Water

- *Enhanced greenhouses...* develop advanced polymer films and other techniques to advance the state-of-the-art in greenhouse technology
Benefits: Capitalize on existing program in Chihuahua to reduce water use in production of live-stock forage, high-value crops for export
- *Geophysical survey techniques...* develop enhanced geophysical survey techniques to improve aquifer characterization leading to better understanding of problems such as salt water intrusion
Benefits: Aquifer characterization is the basis for the solution of many water-related problems
- *Cross-border aquifer databases...* develop bi-national watershed- and aquifer-based databases
Benefits: A knowledge base that will allow for regional and watershed-based planning and management of water resources
- *Improved solar stills...* develop ways to provide potable water to isolated communities and other off-grid sites, including desalination
Benefits: Access to adequate quantities of good quality water for more communities
- *Water and wastewater management...* develop more cost-effective and locally appropriate techniques, focusing on such issues as decentralized treatment, pretreatment of industrial wastewater, and the use of biotechnology for pollution prevention and remediation
Benefits: Techniques with higher probability of adaptation

* In some cases, workshop participants felt that they or their institutions were not the appropriate technical partners, but did commit to seek out those partners.